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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,003	03/21/2006	Luca Merlo	267.198	4541

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NEW YORK, NY 10036

EXAMINER

LAIOS, MARIA J

ART UNIT	PAPER NUMBER
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1753

MAIL DATE	DELIVERY MODE
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06/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,003

Applicant(s)

MERLO ET AL.

Examiner

Maria J. Laios

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☒ Claim(s) 1 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/21/2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: In the last line of the claim “membranes in prevented” needs to be replaced by “membranes is prevented” and the term “inside” is misspelled. Appropriate correction is required.
2. Claim 4 is objected to because of the following informalities: The words “claim 1” is repeated within the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Faita et al (EP 0629 015 A1).

With regard to claim 1, Faita discloses a stack consisting of a filter press modular arrangement comprising a multiplicity of single proton exchange membrane fuel cells (6 membrane 7 electrodes together these make a single proton exchange membrane) and cooling devices (5, internal ducts for passage of cooling means), each cell (6,7) being delimited by a pair of metal bipolar plates (1) and comprising ion exchange membranes (6) and perimetrical sealing gaskets (8) shaped as frames suitable for housing current collectors (14) with in their hollow central part (figure 4), the bipolar plates (1) and gaskets (8) being provided with passage openings

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comprising holes (2, 5, 9) for feeding the reactant gases, for extracting the residual gases with the reaction products, (page 5 line 10), for injecting and discharging a thermostating fluid (page 5 lines 11-12), the lateral migration of ions proceeding from said thermostating fluid inside ion-exchange membranes is prevented.

Claim Rejections - 35 USC § 102/Claim Rejections - 35 USC § 103

5. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Faita et al (EP 0629 015 A1).

Faita et al fails to explicitly disclose the water is circulating in a closed circuit. However, Faita et al discloses the forced circulation of demineralized water to control the temperature (Page 10 line 41) as in a cooling circuit (page 2 line 10). This would indicate that the circuit is closed. Alternatively, it would have been obvious to one of ordinary skill in the art at the time of the invention to have water circulating in a closed circuit in order to make the fuel cell mobile and to save cost on reusing the water.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et al (EP 0629015 A1) in view of Kikuchi et al (US2003/0162078 A1).

With regard to claim 2, in view of claim 1, Faita discloses the structural components as discussed above in claim 1, but fails to mention a bipolar plate closest to the negative terminal is free of passage openings. Kikuchi et al. discloses a fuel cell in which there are terminal plates/bipolar plates (34a, 34b) free of openings for only the plate that is closest to each of the ends of the cell. It would have been obvious to one of ordinary skill in the art at the time of the invention to place the terminal plates near the ends of the cell without openings in order to prevent fluids from passing near the terminal ends.

8. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et al (EP 0629 015 A1) in view of Abd Elhamid et al (US 2005/0267004 A1).

With regard to claim 4, in view of claim 1, Faita discloses the structural components as discussed above in claim 1, and teaches the bipolar plate (1) may be constructed of stainless steel (page 5 line 19) but fails to disclose the composition of the stainless steel. Abd Elhamid et al. teaches a PEMFC in which the bipolar plates have a stainless steel composition of at least 16 percent by weight of chromium, nickel is at least 20 percent by weight and molybdenum is at least 3 percent by weight in order to provide a high bulk electrical conductivity and corrosion resistance (Paragraph 34).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to use stainless steel having a composition of at least 16 percent by weight of chromium, nickel at least 20 percent by weight and molybdenum at least 3 percent by weight for the bipolar plates of the electrochemical cell stack of Fatah in order to provide corrosion resistance electrical conductivity as taught by Abd Elhamid et al.

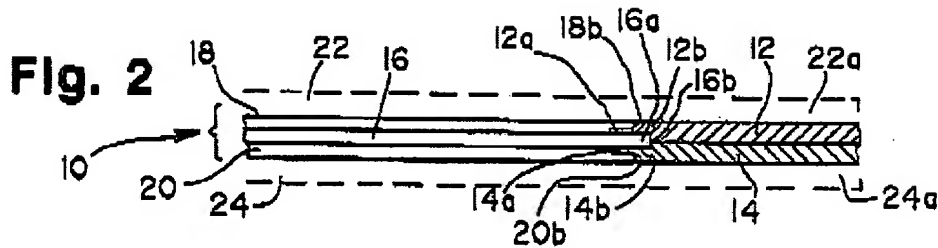
With regard to claim 5, Abd Elhamid et al. further explains that the bipolar plate is a metal substrate (Paragraph 55) this metal substrate/electrically conductive element can be made of stainless steel 316L (Paragraph 38).

9. Claims 3, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatah et al (EP 0629 015 A1) in view of Steck et al (US 5,464,700).

With regard to claim 3, in view of claim 1, Fatah et al discloses the structural components as discussed above in claim 1, but fails to disclose the physical isolation of the ion exchange membranes from the thermostating fluid to prevent the lateral migration of ions. Steck et al. also discloses a Proton Exchange Membrane Fuel Cell (PEMFC) in which gaskets (12,14) provide physical isolation of membrane (16) (col. 5 lines 23-26) in order to prevent dehydration of the membrane. (As shown in Figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to isolate the membrane of Fatah with the gaskets of Steck in order to prevent dehydration of the membranes thereby preventing the lateral migration of ions.

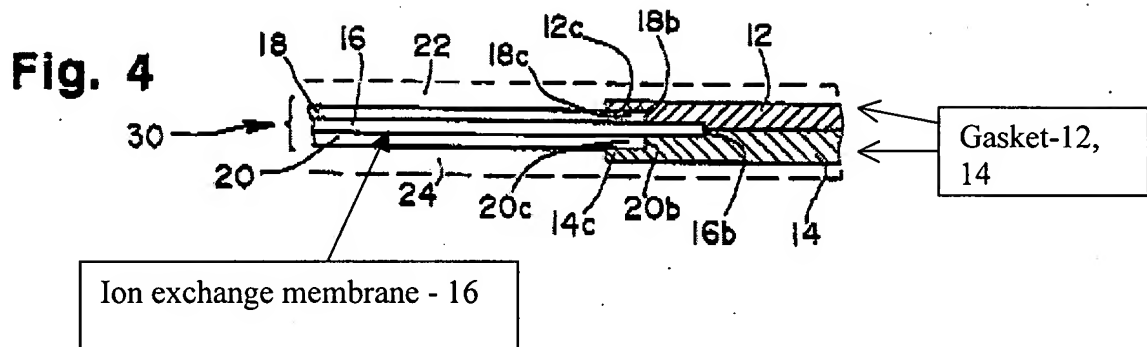
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With regard to claim 7, in view of claim 1, Faita et al discloses the structural components as discussed above in claim 1, but fails to disclose the perimeter of the ion exchange as being in the intermediate region of the gasket, where the intermediate region of the gasket is defined as between the edge of the central hollow portion and the circumference of the passage openings. Steck et al. also discloses a PEMFC with gaskets and teaches that the ion exchange membrane (16) has a region/perimeter (16a) that terminates between the gaskets (12, 14). This overlapping portion prevents leakage of reactor gases and reaction production into the atmosphere and prevents the membrane from dehydrating (col. 5 lines 15-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have the overlapping portion of the membrane in the gaskets of Steck et al. in the fuel cell of Faitia in order to prevent leakage of the gases and dehydration of the membrane

With regard to claim 8, in view of claim 7, Steck further discloses that the gasket material (12, 14) surrounds the perimeter of the ion exchange membrane (16) thereby isolating the ion exchange membrane from a thermostating fluid.

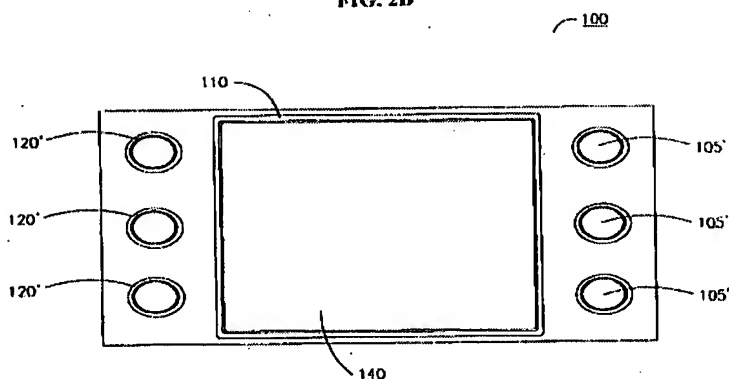


10. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et al (EP 0629 015 A1) in view of Barton et al. (US 6,423,439 B1).

With regard to claim 9, in view of claim 1, Faita et al. discloses the structural components as discussed above in claim 1, but fails to disclose the ion exchange membranes with passage holes matching the passage opening of the gaskets and having a greater section than openings, which are isolated from the thermostating fluid by means of sealing elements/seals located between the edges of the passage holes of the membranes and the passage openings of the gaskets. Barton et al. also discloses a membrane electrode assembly in which the ion exchange membrane has integral seals/sealing elements (120') which circumscribe the passage openings/manifolds/holes (105') thereby sealing the fluid that circulates in openings (105') which allow for sealing of the MEA and other fuel cell components (col. 7 lines 45-47). It is obvious that the seals would match the holes in the gasket as to allow the fluid to pass through the openings.

It would have been obvious to one of ordinary skill at the time of the invention to include the seals of Barton et al. around the openings of the membrane in order to provide sealings of the MEA and other fuel cell components.

FIG. 2B



With regard to claim 10, in view of claim 9, Barton et al. further discloses the sealant material as ethylene propylene dimethyl (EPDM) (col. 5 lines 22-27).

With regard to claim 11, in view of claim 9, Barton et al further discloses the sealant material/non conductive material is flow processable/liquid at the moment of assemble and polymerized by thermal treatment (col. 3 lines 55-63).

With regard to claim 12 and 13, in view of claim 11, Barton et al further discloses the film as a liquid injection moldable compound for example silicones (col. 5 line 25) and from the applicants specification on page 11 "A suitable material is given by liquid silicon resins, which maintain a low hardness and a good elasticity also after completing the curing process"

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria J. Laios whose telephone number is 571-272-9808. The examiner can normally be reached on Monday - Thursday 9:30 - 6:30.

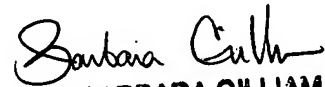
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJL

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BARBARA GILLIAM
PRIMARY EXAMINER